

## **Infarct Size Needed to Cause Adverse Left Ventricular Remodeling in Humans: an MRI Study.**

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**Background:** Post-myocardial infarction (MI) left ventricular (LV) remodeling occurs in the setting of large myocardial infarctions. Current therapies such as emergent reperfusion,  $\beta$ -blockers and ACE-inhibitors have led to significant decreases in adverse remodeling. The accuracy of MRI in measuring LV volumes, geometry, and infarct size makes it a good technique for assessment of post-MI remodeling. Using MRI, we measured MI size in patients more than 2 months after the clinically recognized event to quantify the size of MI needed to result in adverse LV remodeling. **Methods:** Contrast-enhanced MRI was performed on 53 patients at least 2 months after acute MI. LV volumes and sphericity (an indicator of LV geometry derived from the LV long axis/short axis ratio) were measured on cine MRI images (steady state free precession). Size and location of MI were determined using gadolinium-enhanced images with phase-sensitive reconstruction. Infarct size was summarized using the 16-segment model of the American Society of Echocardiography. **Results:** Of the 53 patients, 24 had moderately to severely increased LV end-systolic volume consistent with LV remodeling. There was a moderate nonlinear correlation between MI size and LV end systolic volume ( $r = 0.69$ ). Patients with  $\geq 6$  infarcted segments had significant differences in end-systolic volumes ( $p < 0.001$ ), end-diastolic volumes ( $P < 0.001$ ), and end-diastolic sphericity indices ( $p < 0.007$ ) compared with patients with  $< 6$  segments. Remodeling as described by multiple indices was related to infarct size but not to location. **Conclusions:** The total amount of infarcted myocardium and the number of infarcted segments were able to stratify patients with chronic MI into groups with and without adverse remodeling. Larger infarct size and infarctions in multiple coronary distributions were more closely associated with adverse LV remodeling than infarct location (i.e. anteroapical vs inferior). Studies of post-MI LV remodeling should consider broader enrollment criteria than only patients with first, anterior MI.